

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (Currently Amended) A method for updating firmware within at least one network attached computer over a distributed network comprising:

receiving over the distributed network at the network attached computer, an instruction to begin a firmware recovery procedure, the instruction received while executing an operating system, the operating system being separate from the firmware;

in response to receiving the instruction, rebooting the network attached computer to an operating system independent operating environment;

receiving a new firmware image in fragments over the distributed network in the operating system independent environment;

receiving a broadcast status request prior to updating ~~the a~~ current firmware with the new firmware image;

in response to receiving the broadcast status request, determining whether a rebroadcast of any fragment of the new firmware image is necessary;

in response to determining that the rebroadcast of one or more fragments is necessary, sending a request for the rebroadcast of the fragments;

in response to sending the request for the rebroadcast of the fragments, receiving the rebroadcast of the fragments in response to sending the request; and

in response to receiving the new firmware image, updating ~~[[a]]~~ the current firmware within the network attached computer with the new firmware image, in the operating system independent environment.

2. (Previously Presented) The method of claim 1, wherein the instruction to begin the firmware recovery procedure is received from a manager computer by an agent application executing on the network attached computer in an operating system dependent state, and wherein the method further comprises in response to rebooting to an operating system independent operating environment, sending a notification of readiness to update from the network attached computer over the distributed network to the manager computer.

3. (Original) The method of claim 2, wherein updating the current firmware with the new firmware image comprises erasing the current firmware and copying the new firmware image to a memory location of the network attached computer.

4. (Cancelled).

5. (Cancelled).

6. (Previously Presented) The method of claim 1, wherein determining whether the rebroadcast of any fragments of the new firmware image is necessary comprises determining whether any fragments are missing or corrupted.

7. (Previously Presented) The method of claim 1, wherein the fragments of the new firmware image are numbered.

8. (Original) The method of claim 1, wherein the distributed network supports a user datagram protocol/Internet protocol.

9. (Original) The method of claim 1, further comprising monitoring a communication port of the network attached computer for the instruction to begin the recovery procedure.

10. (Original) The method of claim 9, wherein the communication port of the network attached computer is monitored by a recovery OS application that monitors instruction activity upon only one communication port and utilizes additional processor resources on the network attached computer only upon receiving the instruction.

11. (Original) The method of claim 2, further comprising:
in response to updating the current firmware with the new firmware image, sending a notification of the update to the manager computer.

12. (Original) The method of claim 1, further comprising:
determining whether the current firmware is valid after being updated; and
when it is determined that the current firmware is valid then initiating a boot of the network attached computer utilizing the current firmware.

13. (Original) The method of claim 1, wherein the firmware within the network attached computer comprises a BIOS of the network attached computer.

14. (Original) A computer-controlled apparatus capable of performing the method of claim 1.

15. (Previously Presented) A computer storage medium comprising computer executable instructions which, when executed by a computer, cause the computer to perform the method of claim 1.

16. (Currently Amended) A method for recovering ~~firmware~~ BIOS on a network attached computer over a distributed network, comprising:

determining whether a current ~~firmware~~ BIOS within the network attached computer is invalid;

booting the network attached computer with the current ~~firmware~~ BIOS in response to determining that the current ~~firmware~~ BIOS within the network attached computer is valid;

while the network attached computer is in an operating system independent state,
sending a recovery request in response to determining that the current ~~firmware~~ BIOS is invalid,
the BIOS being separate from the operating system;

in response to sending the recovery request, receiving a new ~~firmware~~ BIOS image over the distributed network; ~~and~~

in response to receiving the new ~~firmware~~ BIOS image, updating ~~[[a]]~~ the current
~~firmware~~ BIOS with the new ~~firmware~~ BIOS image;

determining whether the updated current BIOS is valid after being updated with the new BIOS image; and

in response to determining that the updated current BIOS is valid, booting the network attached computer with the updated current BIOS.

17. (Currently Amended) The method of claim 16, wherein the recovery request is sent to a network address of a recovery manager computer storing the new firmware BIOS image.

18. (Original) The method of claim 17, wherein the network address of the recovery manager computer is stored on the network attached computer.

19. (Original) The method of claim 17, wherein the network address of the recovery manager computer is located by querying a baseboard management controller operating on the network attached computer.

20. (Cancelled)

21. (Cancelled)

22. (Cancelled).

23. (Currently Amended) The method of claim 16, wherein updating the current firmware BIOS with the new firmware BIOS image comprises erasing the current firmware BIOS from and copying the new firmware BIOS image to a memory location of the network attached computer.

24. (Currently Amended) The method of claim 17, wherein sending the new firmware BIOS image comprises broadcasting the firmware BIOS image as a broadcast packet and wherein the new firmware BIOS image is received in fragments over the distributed network, further comprising:

prior to updating the current ~~firmware~~ BIOS and in response to receiving the new ~~firmware~~ BIOS image, receiving a broadcast status request;

in response to receiving the broadcast status request, determining whether a rebroadcast of any fragments of the new ~~firmware~~ BIOS image is necessary;

in response to determining that the rebroadcast of one or more the fragments is necessary, sending a request for the rebroadcast of the fragments over the distributed network; and

in response to sending the request for the rebroadcast of the fragments, receiving over the distributed network, the fragments of the new ~~firmware~~ BIOS image requested.

25. (Currently Amended) The method of claim 24, wherein determining whether the rebroadcast of any fragments of the new ~~firmware~~ BIOS image is necessary comprises determining whether any fragments are missing or corrupted.

26. (Currently Amended) The method of claim 24, wherein the fragments of the new ~~firmware~~ BIOS image are numbered and the request for the rebroadcast excludes or includes a number for each fragment requested.

27. (Currently Amended) The method of claim 17, further comprising:
in response to updating the current ~~firmware~~ BIOS with the new ~~firmware~~ BIOS image, sending a notification of the update to the recovery manager computer.

28. (Cancelled).

29. (Cancelled).

30. (Original) A computer-controlled apparatus capable of performing the method of claim 16.

31. (Currently Amended) A computer-readable storage medium comprising computer executable instructions which, when executed by a computer, cause the computer to perform the method of claim 16.

32. (Original) A system for updating the firmware of at least one network attached computer over a network, the system comprising:

a first computer operative to:

send an instruction to update the firmware of the network attached computer over the network;

receive a notification of readiness for update from the network attached computer over the network; and

in response to receiving the notification of readiness, send a new firmware image over the network; and

a second computer comprising the network attached computer operative to:

monitor a communications port of the second computer for the instruction to update the firmware;

in response to receiving the instruction, transition to an OS independent recovery state;

in response to transitioning to the recovery state, send the notification of readiness to the first computer over the network;

in response to sending the notification of readiness, receive the new firmware image; and

in response to receiving the new firmware image, update the current firmware with the new firmware image.

33. (Original) The system of claim 32, wherein the first computer is further operative to reboot the second computer utilizing the current firmware after the current firmware is updated with the new firmware image.

34. (Original) The system of claim 32, wherein the network supports user datagram protocol/Internet protocol, wherein the new firmware image is received in fragments over the distributed network, and wherein the second computer is further operative to:

prior to updating the current firmware and in response to receiving the new firmware image, receive a broadcast status request from the first computer; and

in response to receiving the broadcast status request, identify any fragments of the new firmware image that are corrupted or missing;

in response to identifying one or more of the fragments that are corrupted or missing, send a request for the rebroadcast of the fragments identified over the network to the first computer; and

in response to sending the request for rebroadcast of the fragments identified, receive over the network from the first computer, the fragments of the new firmware image requested.

35. (Original) The system of claim 32, wherein the second computer is further operative to in response to updating the current firmware with the new firmware image, send a notification of the update over the network to the first computer and wherein the system further comprises a display device wherein the first computer is further operative to display update status messages via the display device.

36. (Original) The system of claim 32, wherein the firmware comprises a BIOS of the second computer.

37. (Currently Amended) A system for recovering the ~~firmware~~ BIOS of at least one network attached computer over a network, the system comprising:

a first computer operative to:

monitor a communication port of the first computer for at least one recovery request;

receive the recovery request from the network attached computer; ~~and~~

in response to receiving the recovery request, send a new ~~firmware~~ BIOS image over the network; ~~and~~

reboot the second computer with the updated current BIOS after the current BIOS is updated with the new BIOS image; and

a second computer comprising the network attached computer operative to:

determine whether a current ~~firmware~~ BIOS on the second computer is invalid while in an OS operating system independent recovery state, the BIOS being separate from the operating system;

in response to determining that the current ~~firmware~~ BIOS is invalid, send the recovery request to the first computer over the network while the second computer is in the operating system independent recovery state;

in response to sending the recovery request, receive the new ~~firmware~~ BIOS image; and

in response to receiving the new ~~firmware~~ BIOS image, update the current ~~firmware~~ BIOS with the new ~~firmware~~ BIOS image.

38. (Cancelled).

39. (Currently Amended) The system of claim 37, wherein the network supports user datagram protocol/Internet protocol, wherein the new ~~firmware~~ BIOS image is received in fragments over the network, and wherein the second computer is further operative to:

prior to updating the current ~~firmware~~ BIOS and in response to receiving the new ~~firmware~~ BIOS image, receive a broadcast status request from the first computer; and

in response to receiving the broadcast status request, identify any fragments of the new ~~firmware~~ BIOS image that are corrupted or missing;

in response to identifying one or more of the fragments that are corrupted or missing, send a request for the rebroadcast of the fragments identified over the network to the first computer; and

in response to sending the request for rebroadcast of the fragments identified, receive over the network from the first computer, the fragments of the new ~~firmware~~ BIOS image requested.

40. (Currently Amended) The system of claim 37, wherein the ~~firmware~~ BIOS comprises a BIOS of the second computer and wherein recovery of the ~~firmware~~ BIOS is executed while the second computer is in an OS independent state.